

**From:** [Reeves, Julie](#)  
**To:** [Amy Defreese](#); [Bill Werner](#); [Brad Rogers](#); [Bryon Holt](#); [Creed Clayton](#); [Cyndie Abeyta](#); [Doug Young](#); [Drue DeBerry](#); [Gary Miller](#); [Jeff Berglund](#); [Jeff Everett](#); [Kelly Douglas](#); [Marisa Meyer](#); [Matthew Stuber](#); [Melissa Burns](#); [Michael Burroughs](#); [Nisa Marks](#); [Stefanie Stavrakas](#); [Stephen Lewis](#); [Susan E Cooper](#); [Suzanne Anderson](#); [Lief Wiechman](#)  
**Cc:** [Tyler Abbott](#)  
**Subject:** Re: Reminder: FO transmission team monthly call Wednesday at 2 MST  
**Date:** Tuesday, September 03, 2013 9:50:57 AM  
**Attachments:** [APLIC BMPs for OM activities in SG habitat review draft.doc](#)

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Update: Drue has asked that we add the draft APLIC document "Development of Best Management Practices for Construction, Operation & Maintenance Activities on Electric Transmission and Distribution Lines (Power Lines) Within Greater Sage Grouse Habitat" to the agenda. Please find the document attached here.

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A thing is right when it tends toward the integrity, stability, and beauty of the biotic community; it is wrong when it tends otherwise. ~Aldo Leopold

On Tue, Sep 3, 2013 at 8:54 AM, Reeves, Julie <[julie\\_reeves@fws.gov](mailto:julie_reeves@fws.gov)> wrote:

Hi, all,

Please remember to call in on Wednesday at 2:00 pm MST for our monthly call to discuss coordination and consistency in our work on transmission lines.

Call in: 1-866-650-7570

Passcode: 889-6811 #

Agenda:

1) Project updates

- a) B2H
- b) EGS
- c) GWW
- d) Sunzia
- e) TWE
- f) V-P
- g) Zephyr
- h) BPA
- i) WCI

2) Important Issues and Topics

- a) Review greater sage-grouse whitepaper (see attached), re: mitigation and V-P
- b) Sigurd to Red Butte compensatory mitigation - Amy
- c) Efficacy of perch deterrents - Group discussion
- d) Dust abatement on unpaved roads - Amy (see manual uploaded to website: <https://sites.google.com/a/fws.gov/fo-transmission-team/home> - Document sharing page)
- e) Facilitating our team: Should we set up a charter? Help with responsibilities?
- f) Others?

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# **APLIC**

**Draft for review and revisions**

**Development of Best Management Practices for  
Construction, Operation & Maintenance Activities on  
Electric Transmission and Distribution  
Lines (Power Lines)  
Within Greater Sage Grouse Habitat**

**July 2013**

Prepared by:  
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4.0	EXISTING AND FUTURE UTILITY CORRIDORS .....	.....
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8.0	MAINTENANCE REQUIREMENTS .....	.....
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8.1.2	<i>Detail Inspection.....</i>	.....
8.1.3	<i>Wood Pole Test and Treat (Detailed Inspection included).....</i>	.....
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9.0	STRUCTURE DESIGNS AND TERMINOLOGY (PHOTOS REMOVED).....	.....
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12.0	RESEARCH	.....

## **1.0 Purpose**

The Avian Power Line Interaction Committee has prepared this document to assist member utilities in obtaining their right of way (ROW) grants, easements or other permits and authorizations in areas identified as important habitat for Greater sage grouse. As well as, federal land management agencies with their development of Land Resource Management Plans (Resource Management Plans [RMPs] and Forest Plans), or other plans, and with their issuance of right of way (ROW) grants, easements or other permits and authorizations in designated Greater sage grouse habitat. This document describes the regulatory statutes utilities operate under, typical operational and maintenance activities or vegetation management programs performed by utility personnel, or its contractors, on existing transmission and distribution power lines and poles/structures; hereafter referred to as power lines. This document also discusses the considerations and requirements associated with siting and construction of new facilities. Since many of these power lines are located on federal lands it is important for land managers and resource agencies to understand operational requirements and maintenance activities, what type of equipment is required, and how often the work is performed. It is also important to understand an electric utility's ongoing needs to access its power lines in order to perform necessary and required maintenance activities and upgrade existing resources or construct new facilities to meet ongoing energy demands.

## **2.0 APLIC Members Commitment to the Environment**

APLIC members consist of both small rural electrical cooperatives and large investor owned electric utility companies serving millions of customers in the western states currently occupied by sage grouse. These service territories cover about xxxxxx square miles with member companies located throughout WY, UT, ID, OR, NV, SD, WA, MT and CO serve thousands of communities. Their infrastructure includes over tens of thousands of miles of transmission lines (the larger structures with larger diameter wire and many insulators, typically steel towers or 2-pole configuration); overhead distribution lines (wires and poles found in rural areas and neighborhoods); underground distribution lines; substations; and interconnects with other utilities serving others outside this area (SEE Sec. 10). Much of this existing infrastructure located in rural areas also crosses sagebrush steppe habitat occupied by sage grouse

APLIC members are committed to operating and maintaining their power lines in ways that minimize impacts to the environment. To that end members and their contractors, will during the course of normal work:

- Conduct all maintenance activities with due regard to preventing damage to vegetation, timber, soil, crops, roads and improvements, and preventing water and soil pollution.
- Not hunt, trap, pursue, harass, intentionally harm or injure biological resources.
- Respect cultural and historic properties.
- Restore the soil disturbed by required maintenance or new construction activities to as near as possible its original condition at the completion of activities.
- Remove any waste material generated because of its activities or operations.

- Receive environmental awareness training to employees and contractors regarding potential impacts to sage grouse and their habitat from their activities.
- Fully comply with the provisions of all applicable state and federal environmental laws and regulations or ROW stipulations.

### **3.0 Regulator, Reliability and Needed Upgrades (expand)**

A key factor in providing reliable electricity is regular inspection and maintenance. Congress has recognized the fact that many power lines are in need of repair or upgrade as illustrated by language contained in the Energy Policy Act of 2005. Among other things, the Act establishes mandatory reliability standards for power lines and provides incentives to transmission companies to upgrade and maintain existing facilities. Various State Public Service Commissions have also imposed inspection and corrective maintenance requirements upon utilities doing business within their states. Most utilities also commit to upgrading existing power lines and other facilities as well as to construct additional power lines and generating capacity when needed.

#### **Working group discussion outline**

##### Regulations and Agencies that Govern Utilities or Siting of Facilities

- a. Endangered Species Act, greater sage-grouse listing potential
  - September 30, 2015 is the end of the USFWS fiscal year, and listing decision deadline
  - Currently there is no evidence that suggests not listing the species
  - Federal agencies seeking opportunities to conserve habitat through regulatory mechanisms (BLM, Forest Service, NRCS)
- b. FERC, NERC, WHEC, PUC's
  - Construction standards
  - Standards and guidelines for reliability
  - Reliability in a catastrophic event (e.g. wildfire, windstorm, plane crash)
  - Requirement for voltage (minimal separations)
  - Audits
  - Potential fines
- c. National Environmental Policy Act (NEPA), Management Plans
  - NEPA process that evaluates impacts and authorizes uses due to finding of no significant impact (FONSI)
  - BLM/USFS management plans that identify compatible and authorized uses
- d. Meeting Customer Demand, and Remaining in Compliance with PUC/Reliability Commitments
  - Double circuit lines and effectiveness/ reliability
  - Transmission versus distribution: demand

- Demand for renewable energy and new powerlines for support
- Growth and need for new facilities to carry generation (each customer is equal)
- Co-locating lines and remaining reliable
- Utility customers guarantees
- Power requirements for industrial customers : uninterrupted service, high loads
- Critical services, need uninterrupted services (i.e. hospitals)

## II. Potential Conflicts with Power Lines and Greater Sage-Grouse

- a. Different requirements among land management agencies, conservation plans
  - CCAA's, differing buffer distances, other T&E species
- b. Habitat fragmentation
  - Reclamation, mitigation, partnerships, funding
- c. Conducting operational activities in different times of year when sage grouse are present

## 4.0 Existing and Future Utility Corridors

A Western Utility Group study of strategic utility corridors in 1992 identified the value and necessity of regional transmission lines in the western United States. That study identified all existing electric transmission lines located across the western United States and, with the cooperation of numerous federal and state agencies, designated new transmission corridors or existing lines as strategically important because of their significance in providing intrastate and interstate energy services to the western US. Many of the utility corridors identified as strategically important contain one or more of APLIC member's power lines. (expand discussion on WECC and designated energy corridors)

Identification of new energy corridors on western federally managed lands is required in the Energy Policy Act (expand discussion). This includes placement of new facilities and designation of energy corridor siting opportunities through the region on BLM and Forest Service-administered lands, except wilderness study areas and some special management areas (including areas of critical environmental concern). APLIC members provided comment and identified potential corridors during the Western Energy Corridor Programmatic EIS process. Recommendations included new facilities would be placed in or adjacent to existing infrastructure within designated energy corridors, when possible, but not adjacent to each other if safety, reliability or resource conflict issues were identified. Areas with important or sensitive resource values would be avoided, whenever possible. Specific proposals would require site-specific environmental analysis and compliance with established local, state and federal permitting and siting processes.

Activities generally excluded from or restricted within transmission (high voltage) utility corridors include mining, materials storage and disposal, range and wildlife habitat

improvements involving facility construction, non-linear energy project development, blasting, excavation, and high profile (tall) facility development.

## **5.0 Description of Lines and Equipment (include info from APLIC Elec. 101)**

Electric utility companies may own and operate facilities where electrical energy is generated and then delivered to their customers. These electrical generation sources could be coal or gas fired, nuclear or renewable facilities such as hydroelectric, geothermal, wind or solar. The energy generated travels over hundreds of miles of transmission lines (the larger structures with larger diameter wire and many insulators, typically steel towers or 2-pole configuration at voltages of 230kV to 700kV) to high voltage substations. This power could interconnect to other utilities serving customers outside this area or voltages are lowered coming out of the substation and then transmitted on lower voltage transmission lines (138kV to 69kV) to industrial users or local substations where the voltage is reduced again and sent out on overhead or underground distribution lines (wires and poles found in cities/neighborhoods). Photos showing various configurations of transmission and distribution structures and equipment are shown in section 9.

## **6.0 Construction of New Power Lines – (needs to be put into a narrative)**

### **Construction Outline from working group**

- I. Buffers
  - a. Seasonal and Spatial
  - b. Reference Plans
  - c. Bird monitors (i.e. nesting season); pre-construction surveys
- II. Traffic Management
  - a. Regulated time of day restrictions
  - b. Speed limits
  - c. Drive and crush: use of mats to conserve sagebrush how do we minimize impacts to avoid damage to sagebrush and keep operations feasible?
  - d. Avoid driving in muddy areas, creating ruts
- III. Weed Control
  - a. During construction
  - b. Cleaning vehicles
- IV. Reclamation
  - a. Local seed bank seeds appropriate for habitat
  - b. Mixes in agricultural areas and right of ways; may need to work with counties to use a seed mix beneficial to sage grouse
  - c. Native seed is not always used
- V. Construction Footprint

- a. Access roads
  - i. Size, type, minimum requirement for needs
  - ii. Use of existing roads where feasible
  - iii. Identify access roads and micro site in low quality habitat even if this results in a longer road
  - iv. Multi-purpose road use for construction and maintenance
  - v. Site staging areas outside of sagebrush habitat, where allowable
  - vi. If vegetation removal is needed, cut rather than mow, so vegetation root mass is maintained
  - vii. If vegetation road clearing is needed, perform prior to nesting season

### Siting Outline

#### I. Power Line Planning

- i. Transmission and Distribution Line Activity
  - 1. Surveying
    - a. Conduct desktop reviews to establish habitat
      - i. Micrositing
      - ii. Company GIS
    - b. Educate employees and contractors on habitat and field protocol
  - 2. Establishing a Route
    - a. Buffers
    - b. Timing
    - c. Avoiding sagebrush habitat
    - d. Noise disturbance
    - e. Collocation

#### II. Management and Standards

- i. Working within Different Management Stipulations
  - 1. Take into account federal/ state energy guidelines
    - a. FERC, NERC reliability standards
    - b. Power line stipulations from different land management agencies
    - c. Mitigation
    - d. Reclamation

Recommended practices or related stipulations from sage grouse conservation plans that may not be feasible or recommended to reduce nesting or perching of raptors or corvids on new lines.

#### I. Perching and Nesting Issue

Background –nesting and perching of raptors and corvids on utility power lines and other tall infrastructure in sagebrush steppe habitats occupied by Greater sage grouse has been perceived as a significant threat to sage grouse due to the likelihood of increased predation on both adults and young. These predation effects are not well understood nor have there been many scientific studies conducted that have documented this threat.

**Underground power lines** – is a mitigation measure often recommended or considered to eliminate or reduce tall structures in sage grouse habitat

- Burying high voltage power lines poses many issues, and is not always feasible. Many factors should be included in the decision process. Power companies are expected to provide immediate and reliable power to customers at the lowest cost possible, and undergrounding can contribute to longer outages and more expensive service that will affect customers. Terrain, habitat type, existing infrastructure or natural features, maintenance access, reliability and construction constraints or other factors are considerations that needs to be evaluated prior to proposing to construct an underground line.
- Characteristics of the line including voltage and type of cable, land use patterns, soil conditions, regulatory acceptance, outage risk and reliability requirements, length and operating limits may make it feasible, or not to bury.
- The ground disturbance is greater for underground lines than overhead lines of the same voltage. The need for trenching and additional ground disturbance of native vegetation may led to introduction of invasive plants and noxious weeds, soil compaction and other factors that impact the native vegetation along the ROW.

**Perch Discouragers** – is another mitigation measure recommended to prevent perching or nesting of corvids and raptors on distribution poles and high voltage transmission line structures.

As research has shown perch discouragers are not successful in preventing corvids, raptors and other birds from perching on wires and very limited in keeping birds off structures. The purpose and intent of using these devices was to reduce bird electrocutions by moving a bird wanting to perch in an unsafe location to a safe perching location on a structure. They were not intended to “prevent” perching. Perch discouragers have also allowed some corvids and other raptors to build nests in locations on the structure not previously occupied due to their design and this can expand the range of corvids.

## 7.0 Access to Existing Power Lines

Federal land managers administer ROW grants and issue easements on federal lands for construction, operation and maintenance of power lines. Pre FLMPA grants and easement language may or may not be clear on right of or designated access routes to existing power lines but the right to maintain and operate is either directly expressed or implicitly understood in each grant or easement. In many cases, a utility’s ROW grants and easements permit the construction, operation and maintenance of an “Electric Power

Line” and required continued access to the power line. Most federal land managers recognize the need for a utility to access its power lines since the operation, maintenance and emergency repair of the power lines can’t be accomplished without reasonable access for vehicles and personnel. In most situations, this can be accomplished by using historical or existing roads and trails but in some cases, the use of overland travel or improvement to historic access routes will be required. The current condition of many power line access roads is adequate for routine line maintenance activities, while in some situations there may be a need to be reworked (generally site-specific activities) or relocated. These types of activities or access needs in areas designated as Greater sage grouse habitat have often been restricted. Reworking or relocating access roads is generally not conducted without the expressed authorization of the land managing agency unless under emergencies.

Most RMPs or Forest Plans restrict the use of off road vehicles, including over the snow, in areas of sensitive resources or special management areas or habitat occupied by sage grouse. APLIC members have power lines that provide power to facilities within some special management areas or have power lines that run through designated habitat or adjacent to them. Utilities must have access to inspect or repair its structures and facilities in these sensitive areas and are willing to work with resource agencies to develop BMPs to minimize any impacts to sage grouse.

In the event of an emergency, a utility must respond as quickly as possible to restore power and may be required to take actions beyond those authorized in its ROW grant. This may include construction of new access routes or reworking access roads without prior review or approvals. In most cases, a land manager would be notified of the emergency and actions taken in concurrence with the utility responding to the emergency. The utility and resource agencies can work together to identify and implement appropriate restoration or remedial measures after the emergency has been addressed.

## **8.0 Maintenance Requirements**

Maintaining the tens of thousands of miles of power lines that cross Greater sage grouse habitat in the western U.S. requires the dedication of many employees and the use of various vehicles and equipment. Dispatchers located in strategic locations and urban areas manage the operations of energy loads on power lines. The flow and amount of electricity on a utility’s lines is dictated by the size of the line, market demands, generation production, price, and available capacity on the power lines themselves.

Maintenance activities are field intensive can be broken down into three components: Routine (inspections, corrective and vegetation management), Major Corrective and Emergency.

- **Routine inspection and maintenance activities** - are ordinary maintenance tasks (see table 1) that have historically been performed and are regularly carried out on a routine basis and will not require new ground disturbances or additional land manager or agency approvals because they are considered actions authorized under the ROW grant. Examples of routine inspections and maintenance activities:

- Safety Inspection (ground and aerial)
  - Detail Inspection (ground)
  - Wood Pole Test and Treat (ground)
  - Outage Cause Inspection (aerial or ground)
  - Adding Bird Protection Devices
  - Problem Nest Management
  - Insulator Replacement
  - Cross Arm Repair or Lowering
  - Cross Arm Replacement
  - Hardware Tightening
  - Conductor Repair
  - Guy Wire Tightening
  - Access Road Maintenance (removal of obstructions)
  - Pole replacement (same location)
  - Vegetation Management
- **Major corrective maintenance activities** - are relatively large-scale planned efforts (see table 2) that occur on an infrequent basis and may require ground disturbance within and outside of existing ROW. Facilities may require replacement due to man or nature caused damages, age of facility, or other factors. Specific proposals would require site-specific environmental analysis and compliance with established permitting processes. Examples of major corrective maintenance activities:
    - Conductor Replacement
    - Access Road Improvement and/or Relocation
    - Multiple Structure Relocation or Replacement
    - Anchor Replacement
  - **Emergency maintenance activities** - are those activities necessary to promptly restore electrical service in the event of an outage. These activities include the need to repair a power line or prevent additional damage to a line that will eliminate a human health or safety hazard and prevent damage to property or resources. Examples of emergency maintenance activities:
    - Restoration of Power/ Broken Equipment Replacement
    - Removal of Problem Bird Nest Causing Imminent Danger
    - Removal of Human Health and Safety Issue
    - Removal of Fire Risk

## **8.1 Routine Maintenance (Inspections)**

### **8.1.1 Safety Inspection**

Utilities are required to perform safety inspections of their transmission lines on a cycle that varies from multiple times per year to every few years. Inspections are performed by an inspector via a 4-wheel drive pickup, 4-wheel drive all-terrain vehicle (ATV), or from the air via a helicopter or fixed wing aircraft. In some cases, the inspector walks the ROW. The inspector assesses the condition of the transmission line and hardware to

determine if any components need repair or replacement, or if other conditions exist that require maintenance or modification activities. The inspector will also note any encroachments and trash dumping on the ROW that could constitute a safety hazard or are unauthorized. The inspector accesses locations along each line and uses binoculars and spotting scopes to perform this inspection. Safety inspections for distribution lines are often conducted on an as needed or regularly scheduled basis.

### **8.1.2 Detail Inspection**

Detailed ground and structure inspections of a utility's transmission and distribution line system may occur on a 1 to 10 year cycle dependent on the criticality of the line segment as determined by the utilities management. The inspector will access all structures of the identified transmission line and check all equipment and other components to determine if repairs or maintenance is required. Inspectors performing this work use conventional 4-wheel drive trucks, 4-wheel drive ATV's, snowcats, or the inspector may walk the line. Helicopters are not utilized for detail inspections but are conducted using binoculars and spotting scopes. Minor repairs to structures might also be done during detailed ground inspections.

### **8.1.3 Wood Pole Test and Treat (Detailed Inspection)**

Many utilities have a wood pole test and treat program. Each pole could be tested on a 5 to 20 year cycle. This program includes hand excavating around the wood pole, completing a detailed inspection of the ground line of the wood pole (to determine extent of wood rot) and re-treating the ground line portion of the wood pole if necessary. Access to structures is with four-wheel drive trucks or 4-wheel drive ATV's. All work included in the detail inspection is also performed at this time.

### **8.1.4 Outage Caused Inspection**

In the event of an outage or interruption in the transmission and distribution of electricity on power lines, a utility will conduct an inspection (aerial or ground) to determine the cause of the interruption. Outage cause inspections utilize similar equipment and points of access as for the other above listed inspections. In addition, trouble trucks (typically a 4-wheel drive truck with a personnel bucket to lift employees to the pole) are used to gain access to the pole for a lineman to determine the cause of the outage and make necessary repairs. This inspection may take place at any time of the day or night and result in emergency repairs.

### **8.1.5 Routine Maintenance (Corrective)**

Routine maintenance activities are ordinary maintenance tasks historically performed and carried out on a regular basis and generally considered authorized under the ROW grant. The work performed is typically repair or replacement of individual components (no new ground disturbance), performed by a relatively small crew using a minimum of equipment, and usually conducted within a period from a few hours up to a few days. Work requires access to the damaged portion of the line to allow for a safe and efficient repair of the facility. Equipment required for this work may include a 4-wheel drive truck, material (flatbed) truck, bucket truck (low reach), boom truck (high reach), or man lift. This work is scheduled and is typically required due to issues found during

inspections. Additional timing or seasonal restrictions can be considered when conducting this work within or that requires travel through designated greater sage grouse habitat.

Responsibly conducted routine maintenance activities have little or no potential to disturb or unduly affect resources within ROWs or access roads and would not require additional permitting or review from land manager or resource agency.

### **8.1.6 Routine Maintenance (Vegetation Management)**

The objective of a utility's Vegetation Management Program is to manage tall vegetation under or around power lines in a cost effective and environmentally conscientious manner to provide safe and reliable power to its customers. Some utilities use the integrated vegetation management (IVM) technique to remove trees and undesirable vegetation. The goal of IVM on utility rights-of-way is to establish sustainable stable, low-growing plant communities that are compatible with power lines and discourage undesirable tall vegetation that could pose potential safety, access, fuel load or reliability problems. IVM requires a combination of manual, mechanical and herbicide control methods. Equipment and materials used will vary with each control method selected. Access is required along the entire power line ROW. Where removal of tall trees and vegetation or “danger trees” is required along a ROW it is unlikely to be within designated greater sage grouse habitat or cause any adverse impacts. Additional timing or seasonal restrictions can be considered when conducting this work and that requires travel through designated greater sage grouse habitat.

With proper IVM, the low-growing vegetation can eventually dominate the right-of-way, inhibit tall-growing vegetation or incompatible species and reduce the need for future treatments. Other benefits include minimized soil disturbance, enhanced plant diversity and improved habitat for wildlife. Establishing native vegetation will also reduce the invasion of noxious weeds into the corridor.

IVM techniques include but are not limited to:

- Manual and mechanical cutting, where wood debris is left on site to enrich the soil. Hand-operated power tools (chainsaws), mechanical equipment and hand tools are used to cut, clear, or prune herbaceous and woody target species.
- Cover type conversion, which uses herbicides in combination with manual/mechanical cutting to remove incompatible tall-growing trees and other vegetation from the right-of-way in order to establish a stable, low-growing plant community.

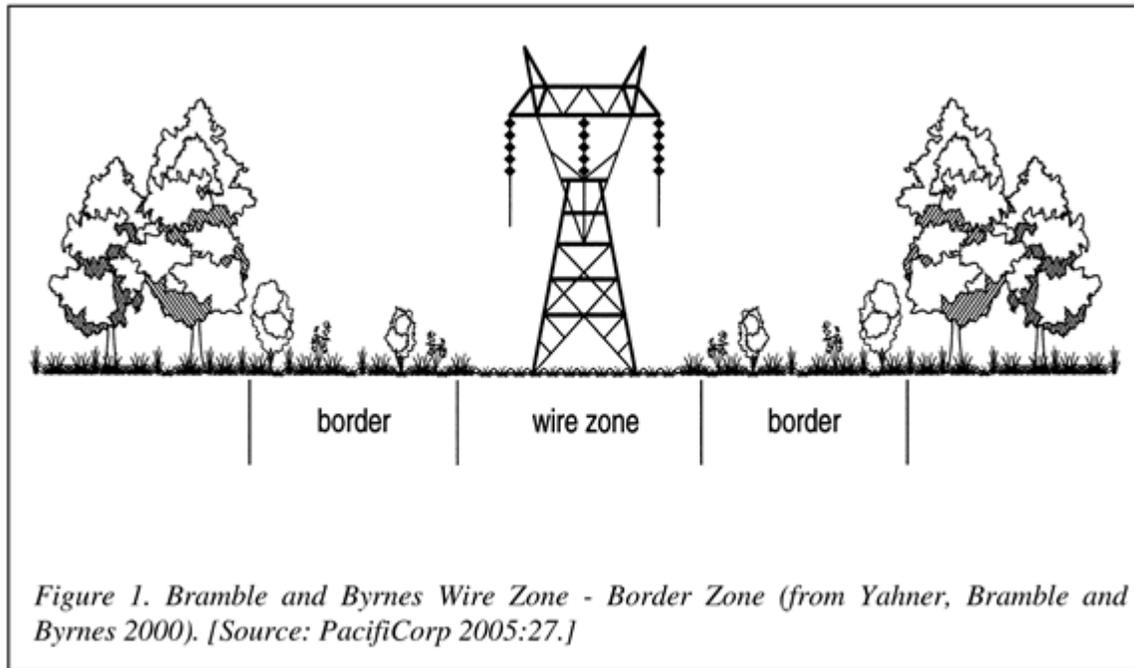
### **Tree Removal**

Removal of trees could occur under the following circumstances.

1 All fast-growing trees located directly below **distribution lines** and that could continually grow back into the lines would be removed. Tree removal would be limited to

the ROW corridor and would not exceed 15 feet on either side of the wires. However removal of large hazard trees would be required beyond this distance

2 Tree removal on **transmission lines** would vary depending on the height of the wires. A description of BMPs for tree removal on transmission lines is provided in the figure below and is taken from PacifiCorp's *Transmission and Distribution Vegetation Management Program* (PacifiCorp 2005:25):



## **Vegetation Management Outline from working group**

### **I. Management for access production and reliability**

- a. Tree trimming for new projects and existing poles
  - i. Tree maintenance for new construction, and possible removal
  - ii. Reliability standards for keeping a clear corridor
- b. Vegetation trimming
  - i. Mowing, only tops of woody vegetation
  - ii. Access to construction site, and clearing for operations and maintenance
  - iii. Fire suppression to reduce imminent danger
  - iv. Providing quality habitat for sage-grouse and safety for human health

### **II. Prevention of Unwanted Plant Species and Control of Vegetated Areas**

- a. Herbicide when sage-grouse would not be negatively impacted

- b. Invasive weed control through minimal construction impact

### III. Strategies to Prevent Habitat Fragmentation

- a. Reclamation of access roads, limiting herbicide use, reducing the footprint
- b. Vehicle inspection to reduce spread of invasive weeds
- c. Reseeding when necessary and applicable after construction
- d. Other habitat rehabilitation

## ***8.2 Major Corrective Maintenance Activities***

Replacement or rebuild activities are relatively large-scale efforts that occur on an infrequent basis and may require ground disturbance activities within an outside of existing ROW. Facilities may require replacement due to being damaged by man or nature, age of facility, or other factors. This work generally is planned and encompasses more work than defined by routine or under emergency activities. It may involve multiple structures, larger work crews, a variety of equipment, including heavy equipment, and usually take weeks or months to complete. Equipment that may be involved includes 4-wheel drive truck, man lifts, material (flatbed) truck, bucket truck, boom truck, tractor trailer, snow cat, excavator (back hoe or track hoe), grader, concrete truck, pumping equipment, crane, etc. Most major activities involve grading, excavation or disturbing soils, and vegetation removal or crushing. New access to or along the power line ROW may be required and timing or seasonal restrictions can be considered for work within or travel through designated greater sage grouse habitat.

Examples of major corrective activities include:

- Conductor Replacement (generally many miles replaced during one project and requires the use of lay-down areas for wire and equipment)
- Access Road Improvement and/or Relocation (involves grading and repair or installation of culverts, drains, loss of vegetation, etc)
- Multiple Structure Relocation or Replacement (generally within or just outside of ROW)
- Anchor Replacement (requires excavation and setting anchor in ground)

## ***8.3 Emergency Maintenance Activities***

The implementation of routine operation and maintenance activities on power lines will minimize the need for most emergency repairs. Emergency maintenance activities are often those activities necessary to repair natural hazards, fire, or man-caused damages to a line. Such work is required to eliminate a human health or safety hazard, prevent imminent damage to the power line or to restore service promptly in the event of an outage. In the event of an emergency, a utility must respond as quickly as possible to restore power and may be required to take actions beyond those authorized in its ROW grant. This may include construction of new access routes or reworking access roads without prior review or approvals. In the event of an emergency, a utility must respond

as quickly as possible to restore power and may be required to take actions beyond those authorized in its existing ROW grant. This may include construction of new access routes or reworking access roads without prior review or approvals. In most cases, notification of a land manager or resource agency (listed in the project contact list) of the emergency and actions taken would be done in concurrence with the utility responding to the emergency. Reasonable efforts will also be taken during emergency response to reduce potential impacts to greater sage grouse or their habitat in designated areas. The utility and resource agencies can work together to identify and implement appropriate restoration or remedial measures after the emergency has been addressed.

One example of a utilities definition of an emergency is:

“Any instance whereby disruption of the flow of electricity has occurred either momentarily or permanently and requires PacifiCorp personnel or its authorized agents to either inspect and/or repair the disruption. In the event PacifiCorp perceives a potential hazard, PacifiCorp is authorized to cross, on a temporary basis, all lands to avert an imminent emergency.”

The equipment necessary to carry out emergency repairs is similar to that necessary to conduct routine maintenance, in most cases. Emergency response to outages may require additional equipment to complete the repairs.

### **Emergency Activities Outline from working group**

Definition of Emergency Activity as defined in this document: *A condition or situation that is imminently likely to endanger life or property or that is imminently likely to cause a material adverse effect on security of, or damage to utility’s electrical system and/or flow of electricity.*

- How does this affect sage-grouse?

#### **I. Focus of Emergency Activities**

- a. Human health and safety
- b. Restoring power
- c. Protecting property
- d. Minimize impacts to sage-grouse while addressing emergency

#### **III. Emergency Activities**

- a. Vegetation Management
  - i. Follow industry standards for vegetation management as set by BMPs
  - ii. Removing dead vegetation or trees
  - iii. Removing vegetation over growth
  - iv. Other considerations in sage-grouse habitat
- b. Maintenance
  - i. Addressing human safety and imminent danger first
  - ii. Addressing broken insulators, cross arms, conductors, etc.
- c. Outages
  - a) Minimization and Prevention
    - i. Removing problem nests while considering sage-grouse
    - ii. Other environmental hazards posing a threat to reliability

d. Fires

- a) Assess risk to human health and potential fire occurrence
- b) Assess and identify impacts if fire occurs
- c) Communicate with land management agencies to conduct rehabilitation on a case-by-case basis post fire

DRAFT

**Table 1. Routine Maintenance Activities**

Activity	Description	Equipment	Frequency/Duration
Aerial Inspection	Visual inspection of lines and poles to detect any problems	Helicopter	Annual or semi-annual/Day(s)
Access Road Maintenance	Removal of road access obstructions	4wd truck back hoe	As needed/Day(s)
Guy Wire Tightening	Tightening guy wires	Bucket truck or boom truck	As needed/Days
Bird Nest Removal	Removing bird nests that pose a fire threat, hazard to the bird or potential power outage	Bucket truck or boom truck	When problem nests are identified/Day(s)
Cross Arm Replacement	Installing new cross arm to pole	bucket truck or boom truck	As needed/Day(s)
Cross Arm Reframing	Lowering cross arms to obtain 60-inch clearance between conductors	bucket truck or boom truck	As necessary/Day(s)
Ground Inspection	Visual and physical inspection of lines and poles to detect any problems	ATV 4wd truck	Semi-annual or annual/Day(s)
Hardware Tightening	Tighten existing hardware on structures	boom truck or bucket truck	As needed/Day(s)
Insulator Replacement or Conductor Repair	Replacement of an insulator upon failure or repair of a broken conductor	bucket truck or boom truck	As needed/Day(s)
Installation of Bird Perching and Nesting Discouragers	Connecting material to cross arms and poles	bucket truck or boom truck	As needed/Day(s)
Installing Bird Protection Measures	Installing protective covers, adding new equipment, removing ground wire, or nest platforms	bucket truck or boom truck	When problem structures are identified/Day(s)
Pole Testing and Treatment	Take core samples from poles and treat poles with chemical preservative	ATV 4wd truck	10-16 year cycle/Day(s) to week(s)
Pole Replacement	Individual pole replacement in same location	bucket truck or boom truck	When problem structures are identified/Day(s)
Vegetation Management	Clearing of undesirable vegetation and danger trees* from ROW and hazard trees* that are within the ROW or adjacent to the ROW <i>*danger and hazard trees as defined in ANSI A300</i>	ATV 4wd truck bucket truck chainsaws mower or sprayer (herbicide use)	3-4-year cycle for distribution lines/Day(s) to week(s) 3-10 year cycle for transmission lines/Day(s) to week(s)

**Table 2. Major Corrective Maintenance Activities**

<b>Activity</b>	<b>Description/ Impact</b>	<b>Equipment</b>	<b>Frequency/Duration</b>
Multiple Structure Relocation or Replacement	Create landing pad and pole laydown area, dig new pole holes and anchor holes, frame structure, remove old pole  2-3	4wd truck, boom truck, excavator, bulldozer or other tracked vehicle, bucket truck, helicopter or crane, material truck	As needed/Days to weeks
Anchor Replacement	Installation of new anchor  1	4wd truck, back hoe	As needed/Days
Conductor Replacement	Replacing conductor typically associated with a non-emergency pole change-out  1-2	4wd truck, boom truck, bucket truck, material truck, crane or helicopter	As needed/Days to weeks
Access Road Improvement and Relocation	Altering the alignment of any existing access routes, creating replacement access, substantial grading, installing additional culverts  2-3	4wd truck, bulldozer, grader, excavator, material truck	As needed/Days to weeks

Disturbance Impact Scale: 1- low impact, work within ROW; 2- moderate impact, work within and adjacent to ROW; 3- greater impact, some work within ROW but most work likely outside of ROW

## **9. Structure Designs and Terminology (photos removed)**

## **10.0 Best Management Practices - (to be developed)**

### **Mitigation outline from working team**

- I. Triggers for the processes of the where, when and what to address mitigation
  - a. NEPA process
  - b. Unavoidable impacts
- II. Mitigation Tool Box
  - a. Grazing management
  - b. Spring restoration; potential for West Nile Virus: running water versus ponds
  - c. Construction easements
  - d. Genetically modified sagebrush seeds to increase growth. Is this an option for future management? Sagebrush is difficult to grow
  - e. Washington State University is working with fungus (black fingers of death) to remove cheat grass. The fungus helps to inhibit cheat grass, and encourages natives to grow. FWS is in process of licensing with EPA
  - f. Fence removal and marking
  - g. SGI, Equipment, WHIP
  - h. Fire suppression, fire management, and green stripping
- III. Funding
  - a. Need for agency consensus for funding research as mitigation
  - b. Efforts from WAFWA
  - c. Feathering right of way edges
- IV. Restoration and Strategy
  - a. Habitat restoration and improvements for sage-grouse on co-owned lands
  - b. Mitigation banking
    - i. FWS is exploring this intensively
    - ii. Use for other species
    - iii. Current problems include staffing
    - iv. Partnerships would be beneficial

## **T&D Projects — Environmental Checklist (add examples)**

## **11.0 Specific Agency Permit Restrictions or Conditions – (added as required)**

## 12.0 Research - (to be revised)

### Electromagnetic Fields – (remove??)

Naugle et al. (2010) raised the concern that sage-grouse may also avoid transmission lines because “electromagnetic radiation emitted from transmission lines has a variety of negative effects on other bird species using areas on or near lines (Fernie and Reynolds 2005). Balmori (2005, 2006), Balmori and Hallberg (2007), and Everaert and Bauwens (2007) suggested possible cause-effect relationships between high levels of electromagnetic radiation within 500 m of cellular towers and reduced population or reproductive performance of a limited number of bird and amphibian species. These negative effects are similar to those documented for bird species exposed to electromagnetic radiation generated by power lines (Fernie and Reynolds 2005).

- iii. Falcon to Gondor (University of Nevada) – a ten year research study was recently completed on a high voltage transmission line to assess direct impacts to sage grouse in northern Nevada.
- A correlation was found between annual pre-fledgling chicks survival estimates and spring climate conditions, with high accumulated spring precipitation
  - Predation was the major source of mortality, and accounted for 89% of all mortalities identified during the study. During the nesting season, mortality by raptor and mammal predation was relatively equal, resulting in cumulative risks of 0.10 and 0.08, respectively. In the fall, the cumulative risk of mammal predation was greater than that of raptors or human harvest. During both seasons observations showed relatively few additional sources of mortality (e.g. collision) and observed no instances of disease-related mortality (e.g. West Nile Virus).
  - In the pre-fledging chick survival analyses, distance from the Falcon-Gondor transmission line was supported in model results and the parameter estimate was significant. However, the negative influence of distance from the Falcon-Gondor transmission line suggests that early chick survival was higher if the brood was located closer to the transmission line, which may potentially be confounded with differences in pre-fledging chick survival between the Roberts and Cortez sage grouse populations. In the female survival analyses, there was no support found for an influence of nest distance from the Falcon-Gondor transmission line on spring, fall, or annual survival. In the male survival analyses, model results supported an interaction between the amount of wildfire footprint surrounding a lek and the distance of the lek from the Falcon-Gondor transmission line on survival of males. However, this interaction suggests that annual survival for males is higher for males that attend leks closer to the transmission line. This interaction was most likely driven by extremely low survival of males at the Horse Creek lek, which had the largest amount of wildfire scarring, and, coincidentally, was located the furthest from the Falcon-Gondor transmission line. In the male lek movement

analysis, we found no support for an influence of the Falcon-Gondor transmission line on male movement rates between leks.

- Transmission Line Analysis: After ten years of investigating the potential impacts from the Falcon-Gondor transmission line the results suggested no negative effects on demographic rates (i.e., male survival and movement, female survival, pre-fledging chick survival, and nest survival) that could be explained by an individual's proximity to the transmission line.

iv. Dr. Terry Messmer at USU (telemetry and micro siting)

- In this study GIS-based viewshed analysis was used to look for evidence that sage grouse in Utah and Southeast Idaho are avoiding powerlines based on visibility of the tall structures. His analysis is using a large database of sage grouse locations collected from 1998-2012. Kernel density plots of observable grouse distances from powerlines did not support an avoidance hypothesis, as the occurrence frequency of visible grouse did not increase with distance from powerlines. This informal test of an avoidance hypothesis assumes that powerlines were in place when sage grouse locations were collected, and further assumes that field collection methods were not biased with respect to proximity from powerlines locations.

v. Chad LeBeau's Master's Thesis (wind and transmission) – study was conducted in an existing and proposed wind farm development in Wyoming to assess avoidance behavior and use of areas with wind turbines and power lines

- Greater sage-grouse did not avoid wind turbines during the nesting and brood-rearing periods, but did select for habitats closer to turbines during the summer season. Greater sage-grouse nest and brood survival decreased in habitats in close proximity to wind turbines, whereas female survival appeared not to be affected by proximity to wind turbines. Peak male lek attendance within both study areas experienced significant declines from 1 year pre development to 4 years post development; however, this decline was not attributed to the presence of the wind energy facility.
- Greater sage-grouse were not avoiding the wind energy development two years following construction and operation of the wind energy facility. This is likely related to high site fidelity inherent in sage-grouse. In addition, more suitable habitat may exist closer to turbines at Seven Mile Hill, which may also be driving selection. Fitness parameters including nest and brood survival were reduced in habitats of close proximity to wind turbines and may be the result of increased predation and edge effects associated with the wind energy facility. Lastly, wind energy infrastructure appears not to be affecting male lek attendance 4 years post development; however, time lags are characteristic in greater sage-grouse populations, which may result in impacts not being quantified until 2–10 years following development.
- Future wind energy developments should identify greater sage-grouse nest and brood-rearing habitats prior to project development to account for the

decreased survival in habitats of close proximity to wind turbines. More than 2 years of occurrence data and more than 4 years of male lek attendance data may be necessary to account for the strong site fidelity and time lags present in greater sage-grouse populations. Knick and Hansen (modeling effort, sage-grouse persistence relative to anthropogenic features)

- vi. Seasonal Activities (taken from *Greater Sage-Grouse* Knick, and Connelly)
- Movement of Sage-grouse, according to Connelly et. al. can be placed into several categories: dispersal from place of hatching to place of breeding or attempted breeding, movements of individuals within a season, migration between distinct and, spatially separated seasonal ranges, home ranges that sum all movement types seasonally or annually: movements to obtain food, visit loafing or roosting sites, and engage in breeding behavior as well as migrations. Migrations have been defined as grouse moving >10km between seasonal ranges.
  - Some grouse have use areas that are distinct for winter, breeding and summer ranges, and others utilize the same location throughout the year. Sage-grouse may migrate between two to three differing sites, or may not migrate at all (Connelly et al. 2011).
  - Grouse that are not migrating may move > 10km throughout the year, or migratory sage-grouse may move up to 100 km.
  - Autumn migration peaks in mid-October and extends into late November. Spring migration occurs mid-February to mid-March, and summer migration in late May through early August. Migration may be initiated by weather and migration speeds and distance can vary and these variations are not readily understood.
  - In Colorado, Washington and Wyoming it was indicated that unsuccessful females moved farther between consecutive nests more so than successful females, but didn't display this behavior in the Dakotas. And longer distances between nests did not account for successful rearing